

# ***Handling and Disposal of Unwanted Radioactive Material***

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At the DOD Executive Agency for Low-Level Radioactive Waste at the Operations Support Command in Rock Island, Illinois, we are in the process of rewriting Army Technical Manual 3-261, *Handling and Disposal of Unwanted Radioactive Material*. We thought it might be helpful to generators of excessed radioactive materials to put out guidelines to follow in collecting and consolidating those materials in preparation for removal off-post. We published a series of four articles in our newsletter, the RAD WASTE NEWS and have consolidated them here for your information and convenience.

## ***PART 1 - HOW TO SELECT A CONSOLIDATION AREA FOR EXCESSED RADIOACTIVE MATERIAL***

**AREA.** Pick site according to installation needs for location, security and size.

**SITE SELECTION.** Guidelines for selection of a consolidation site:

- a. Security must ensure no unauthorized entry.
- b. Minimize the risk of fire, explosion or flood.
- c. Consolidate only radioactive materials in the designated area.
- d. Ventilate the area especially if storing tritium or radium.
- e. Have personnel decontamination facilities available.
- f. Isolate the area from other activities of the installation to help minimize personnel exposure.
- g. Have smooth surfaces on walls floors, shelves; seal floors if storing liquids; etc., this will help in the safe, economical and rapid decontamination of the area if necessary.
- h. Drain water from the storage area away from domestic water supplies (surface and subsurface sources).
- i. As able, do not put site in an area subject to inclement weather.

j. Area should be free of animals, such as rodents, which can gnaw into storage containers or track radioactive contamination out of the storage area.

We realize all of these guidelines may not apply to your particular situation. When selecting your consolidation area, please use the pertinent guidelines.

## ***PART 2 - COLLECTING AND CONSOLIDATING EXCESS RADIOACTIVE MATERIAL IN PREPARATION FOR REMOVAL OFF-POST.***

**WHO.** The installation RSO will collect excessed materials at the temporary storage site to hold for shipment.

**OTHER SITES.** If material is generated and temporarily stored at satellite sites, the installation RSO should furnish collection containers (metal drums preferred) to the local generator then move the filled containers to the base storage .

**STORAGE.** As feasible, store materials on shelves or pallets rather than containers. This allows the shipping broker to volume reduce the materials and pack the shipping containers efficiently while eliminating the need to unpack the storage container.

**LICENSED MATERIAL.** Keep quantities of each radionuclide within the applicable Nuclear Regulatory Commission license limits; e.g., no more than 10,000 Ci of tritium.

**SURVEYS.** Perform radiological surveys of areas at least quarterly or as required by the appropriate NRC license or Army guidance document.

### **SOLIDS:**

a. Line collection containers with plastic.

b. Segregate like items, e.g. same National Stock Number (NSN), in plastic bags (4 mil, clear preferred) and mark the bag with the NSN, radionuclide (H3, Ra226, Am241, etc.), item name, quantity, and activity per item. Double bag broken items in plastic and segregate from intact items.

c. If storing items in containers, make inspection of the contents easy for the shipping broker, i.e. easily removed and visible.

d. Do not compact materials unless approved by the Safety/Rad Waste Disposal Team at the Industrial Operations Command, DSN 793-2989, comm (309) 782-2989.

## **LIQUIDS:**

- a. Segregate liquids from solids.
- b. At the generation site, collect radioactive liquids in plastic, earthenware, or thick-walled glass bottle inner containers. The container must not break if the liquid freezes. Place the inner containers in overpack containers and fill the overpack with an absorbent to contain leaks.
- c. Do not solidify liquids. The shipping broker will determine the requirements for shipment based on the material.
- d. Identify scintillation fluids containing hazardous material (toluene or xylene) and dispose within 90 days of generation.

**MARKING COLLECTION CONTAINERS.** Maintain the inventory of contents and the maximum radiation level for each container.

**MONITORING CONTAINERS.** Check collection containers periodically to assure that:

- a. Containers are in good condition and do not leak; i.e., no holes, no rust.
- b. Outside container surfaces are free of removable contamination.
- c. Containers are properly marked.

## ***PART 3 - PREPARATION OF EXCESSED MATERIALS FOR SHIPMENT***

### **DISPOSITION REQUEST**

The installation Radiation Safety Officer (RSO) will request disposition of excessed materials, by memorandum, fax or e-mail, to the Safety/Rad Waste Team at :

U.S. Army Operations Support Command (Prov)  
ATTN: AMSOS-SF  
1 Rock Island Arsenal  
Rock Island, IL 61299-6000  
DSN 793-0338 Comm (309) 782-0338  
Fax DSN 793-2988 E-mail amsos-sf@osc.army.mil

Army National Guard units will send their requests to the Communications-Electronics Command Safety Office at:

U.S. Army Communications-Electronics Command  
Directorate of Safety Risk Management  
Radiological Engineering Division  
ATTN: AMSEL-SF  
Fort Monmouth, NJ 07703-5024

The installation RSO will determine when to make the request. In general, accumulate materials until you are 6 months from capacity or, for small generators, enough to fill a 55-gallon drum. Do not request disposition for very small quantities, e.g. 5 tritium compasses, unless circumstances warrant it.

### **SHIPMENT PREPARATION**

Use metal drums as shipping containers. Get approval for other types of containers from the Safety/Rad Waste Team, DSN 793-0338. While any sealed metal drum qualifies as an excepted package, the following national stock numbers also are 7A Type A containers:

#### 55 Gallon

8110-01-454-1950

8110-01-454-2148

8110-01-454-1952

8110-01-454-2151

#### 30 Gallon

8110-01-454-1841

8110-01-454-1827

#### 85 Gallon

8110-01-454-1956

Update and double-check the inventory of materials. The inventory should include:

Nomenclature	Activity/Item (mCi/MBq)
NSN	Total Activity (mCi/MBq)
Quantity	Weight of Container (if packed)
Radionuclide	Volume of Container (if packed)

Ensure the inventory:

- 1) Does not have free standing liquids.

2) Does not have hazardous materials e.g. lead. Identify mixed wastes.

3) Does not have two or more substances which may chemically react.

4) Has sharps identified and separated from other materials. Mark packages containing sharps as such and certify the package as non-infectious.

## ***PART 4 - TRANSPORTATION OF EXCESSED MATERIALS***

This is the fourth and final in the series for guidelines to follow in collecting and consolidating excess radioactive material in preparation for removal off-post. The series will be part of the Army Pamphlet 11-9, *The Army Radiation Safety Program*, when published.

### **ON-POST TRANSPORT**

You may move excess radioactive material on your installation without the same requirements for movement off-post if public roadways are not used during transport. Follow the guides listed below:

a. Loading:

(1) Keep within weight limitation for the vehicle.

(2) Limit or arrange the containers to keep radiation exposures to personnel (including driver) as low as possible, e.g. put containers in back of truck away from cab.

(3) Block and brace or tie-down containers as necessary.

b. Do not haul loose radioactive materials. Keep tailgates closed.

c. Use sturdy containers which are sealed tight and free of contamination.

d. Use a suitable vehicle, e.g. one that is easily decontaminated if necessary. Do not use a privately owned vehicle. Leased or rented vehicles leases may prohibit transport of hazardous materials.

e. Plan the route to avoid heavy traffic or personnel activity and

explosives storage or handling. If deemed necessary by the RSO, notify the fire and military police departments of exact route and time to allow for special protective measures.

f. Check with the Safety Office for driver and radioactive material movement requirements. The driver may need a license for hazardous materials. A person trained on radiation safety should accompany the shipment.

g. As able, radiologically survey the vehicle prior to and after the movement.

### **OFF-POST TRANSPORT**

Transport materials IAW Department of Transportation (DOT) regulations, Army and Operations Support Command requirements. We will make the shipment or provide detailed instructions for the installation to make the shipment. In addition:

a. Ensure proper blocking and bracing or tie-down of the containers.

b. Brief the driver or escort on the potential hazards and emergency procedures.

We hope that you have found this series helpful and informative. We have tried to provide you, the generator, with the guidelines needed for collecting and consolidating excess radioactive material in preparation for removal off-post. There are also considerations with state and regional compact regulations that regarding the export of excess material, material for recycle or waste for disposal. Our Charter makes us responsible for assuring the safe, cost effective and compliant disposal of all DOD LLRW and we know that there will always be questions and probably unique situations. Please direct your questions to Mr. Kelly Crooks, (309) 782-0338, email: [crooksk@osc.army.mil](mailto:crooksk@osc.army.mil).

